



GreenRon Energy Limited
力朗能源有限公司

MSDS for Li-ion Battery

FILE NAME: Material/Product Safety Data Sheet
PRODUCT: Li-ion Battery (Li(NiCoMn)O₂)
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Notice: If the document wasn't signed and stamped, the information (subject to change without prior notice) contained in this document is for reference only and should not be used as a criterion for product guarantee or warranty.

**Section 1 – Chemical Product and Company Identification****Product Name:** Li-ion Battery (Li(NiCoMn)₂ Sealed rechargeable Cells)**Battery Type:** Series (According to the model size and design)**Manufacturer:** GreenRon Energy Limited**Address:** Unit 11, 5/F., Tower A, New Mandarin Plaza, 14 Science Museum Road, TsimShaTsui, Kowloon, Hong Kong**Tel:** 852-2723 3280**Emergency Telephone:** 852-2723 3280**Fax:** 852-2366 0863**Section 2 – Composition/Information on Indredient**

Chemical Composition	Chemical Formula	CAS No.	Weight (%)
Lithium nickel cobalt manganese oxide	Li(NixCoyMn1-x-y)O ₂	12190-79-3 12031-65-1 12162-79-7	28-32
Organic Solvents	—	—	—
EC	C ₃ H ₄ O ₃	96-49-1	10-12
DMC	C ₃ H ₆ O ₃	616-38-6	
EMC	C ₄ H ₈ O ₃	623-53-0	
Lithium Hexafluorophoshate	LiPF ₆	21324-40-3	2.5-3
PVDF	(CH ₂ -CF ₂) _n	24937-79-9	1.0-1.5
Copper	Cu	7440-50-8	8-10
Aluminum Foil	Al	7429-90-5	3-5
Graphite Foil	C	7782-42-5	12-14
Shell	—	—	15-20

Section 3 – Hazards Identification**Health Hazards (Acute and Chronic)**

These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. Contact of electrolyte and extruded lithium with skin and eyes should be avoided.

Sign/Symptoms of Exposure

A shorted lithium battery can cause thermal and chemical burns upon contact with the skin.



Section 4 – First Aid Measures

Eye

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin

Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

Inhalation

Remove from exposure and move to fresh air immediately. Use oxygen if available.

Ingestion

Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious.

Call a physician.

Section 5 – Fire Fighting Measures

Flash Point: N/A.

Auto-Ignition Temperature: N/A.

Extinguishing Media: Dry chemical, CO₂.

Special Fire-Fighting Procedures

Self-contained breathing apparatus.

Unusual Fire and Explosion Hazards

Cell may vent when subjected to excessive heat-exposing battery contents.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide, lithium oxide fumes.

Section 6 – Accidental Release Measures

Steps to be Taken in case Material is Released or Spilled

If the battery material is released, remove personnel from area until fumes dissipate.

Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the batteries to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

Waste Disposal Method

It is recommended to discharge the battery to the end, handing in the abandoned batteries to related department unified, dispose of the batteries in accordance with approved local, state, and federal requirements. Consult state environmental protection agency and/or federal EPA.



Section 7 – Handling and Storage

The batteries should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.

Precautions to be taken in handling and storing

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

Other Precautions

Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

Section 8 – Exposure Controls, Personal Protection

Respiratory Protection

In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting batteries. Respiratory Protection is not necessary under conditions of normal use.

Ventilation

Not necessary under conditions of normal use

Protective Gloves

Not necessary under conditions of normal use.

Other Protective Clothing or Equipment

Not necessary under conditions of normal use

Personal Protection is recommended for venting batteries: Respiratory Protection Protective Gloves, Protective Clothing and safety glass with side shields.

Section 9 – Physical and Chemical Properties

Nominal Voltage: 3.7V.

Rated Capacity: In accordance with the specification or the product marking.

Appearance Characters: cylindrical, with odorless battery.

Chemical Uses: Chemical power.



Section 10 – Stability and Reactivity

Stability

Stable

Conditions to Avoid

Heating, mechanical abuse and electrical abuse.

Hazardous Decomposition Products

N/A.

Hazardous Polymerization

N/A.

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis halogenated hydrocarbons.

Section 11 – Toxicological Information

Inhalation, skin contact and eye contact are possible when the battery is opened.

Exposure to internal contents, the corrosive fumes will be very irritation to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

Section 12 – Ecological Information

When promptly used or disposed the battery does not present environmental hazard.

When disposed, keep away from water, rain and snow.

Section 13 – Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

If batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of significant amount of uncreated or unconsumed lithium remaining in the spent battery. The batteries must be neutralized through an approved secondary treatment facility prior to disposal as a hazardous waste. Recycling of battery can be done in authorized facility, through licensed waste carrier.

Section 14 – Transport Information

According to PACKING INSTRUCTION 965~967 of the 58th Edition of the IATA Dangerous Goods Regulations (DGR), or the provisions set out in the Edition of the ICAO Technical Instruction for the Safe Transport of Dangerous Goods by air, or the special provision 188 of IMDG CODE and ADR, or the 《Recommendations on the Transport of Dangerous Goods Model Regulations》.



All shipments containing Lithium ion Batteries are subject to dangerous goods regulations for air, road and sea transport.

Lithium ion batteries are classified in Class 9 – Miscellaneous dangerous goods as:

- UN 3480, Lithium ion batteries in bulk (PI 965).
- UN 3481, Lithium ion batteries contained in equipment (PI 967); or
- UN 3481, Lithium ion batteries packed with equipment (PI 966).

Lithium Batteries can be transported in 2 different ways:

A: As a class 9, full dangerous goods shipment

IN the absence of exceptions, these batteries must be shipped in quantities that comply with the limitations contained in the Regulations (see DGR Table 4.2). Also, they must be contained in specification packaging prescribed by the ICAO Technical Instructions and IATA Dangerous Goods Regulations.

B: As an "Excepted" Lithium Battery shipment

B-1 Air : Section II of the relevant Packing Instructions of the IATA DGR

Small lithium ion batteries are excepted from most of the requirement of the ICAO Technical Instructions and IATA DGR provided that they comply with all of the requirements set out Section II of Packing Instructions 965, 966 and 967 for lithium ion batteries.

Note: Only batteries that have successfully passed the test produces of Part III, Sub-Section 38.3 of the UN Manual of Tests and Criteria qualify under this exception.

B-2 Road (Europe) : ADR special provision 188

B-3 Sea (Ferry): IMDG code special provision 188

Separate Lithium-ion batteries when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles and wet by rain.

Transport Fashion: By air, by sea, by railway, by road.

More information concerning shipping, testing, marking and packaging can be obtained from Label master at <http://www.labelmaster.com>.

Section 15 – Regulatory Information

Law Information

- 《Dangerous Goods Regulation》
- 《Recommendations on the Transport of Dangerous Goods Model Regulations》
- 《International Maritime Dangerous Goods》
- 《Technical Instructions for the Safe Transport of Dangerous Goods》
- 《Classification and code of dangerous goods》
- 《Occupational Safety and Health Act》 (OSHA)
- 《Toxic Substances Control Act》 (TSCA)
- 《Consumer Product Safety Act》 (CPSA)
- 《Federal Environmental Pollution Control Act》 (FEPCA)



《The Oil Pollution Act》(OPA)
《Superfund Amendments and Reauthorization Act Title 111 (302/311/312/313)》(SARA)
《Resource Conservation and Recovery Act》(RCRA)
《Safety Drinking Water Act》(CWA)
《California Proposition 65》
《Code of Federal Regulations》(CFR)
In accordance with all Federal, State and Local laws.

Section 16 – Additional Information

The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.